Claims

We claim:

1. An electrocardiography device for obtaining electrocardiograms from an animal, the device comprising:

a. first and second intravenous catheters inserted in the animal;

b. at least two test leads, each of the at least two test leads connected to one of the first and second intravenous catheters;

c. a reference lead;

d. an electrically-conductive, physiological solution contained in each of the first and second intravenous catheters; and

e. an ECG monitoring device operatively connected to the at least two test leads and the reference lead.

2. The electrocardiography device of claim 1, wherein the reference lead is connected to the animal.

3. The electrocardiography device of claim 1, further comprising a movement responsive caging system for housing the animal.

4. The electrocardiography device of claim 3, further comprising an automated blood controller connected to the first and second intravenous catheters.

5. The electrocardiography device of claim 4, further comprising a computer operatively connected to the automated blood controller.

6. The electrocardiography device of claim 5, further comprising an output device for displaying an electrocardiogram from the ECG monitoring device.

7. The electrocardiography device of claim 6, wherein the output device comprises a

printer.

8. The electrocardiography device of claim 6, wherein the output device comprises a display screen.

9. The electrocardiography device of claim 4, wherein the automated blood controller and the ECG monitoring device comprise a single control device.

10. The electrocardiography device of claim 5, wherein the automated blood controller, the ECG monitoring device, the output device, and the computer all comprise a single device.

11. The electrocardiography device of claim 1, wherein the electrically-conductive, physiological solution comprises saline.

12. The electrocardiography device of claim 1, wherein the electrically-conductive, physiological solution comprises Ringer's solution.

13. The electrocardiography device of claim 1, wherein the electrically-conductive, physiological solution comprises blood.

14. The electrocardiography device of claim 1, wherein the electrically-conductive, physiological solution further comprises at least one drug.

15. The electrocardiography device of claim 2, wherein at least one of the at least two test leads comprises:

a. a socket connection connected to the ECG monitoring device;

b. a flexible wire having a first end and a second end, the second end connected to the socket connection;

c. a hollow tube connected to the first end of the flexible wire and connected to one of the first and second catheters; and

d. an extender wire placed inside one of the first and second catheters connected to

the hollow tube and within the electrically conductive, physiological solution.

16. The electrocardiography device of claim 2, wherein at least one of the at least two test leads comprises:

a. a socket connection connected to the ECG monitoring device;

b. a flexible wire having a first end and a second end, the second end connected to the socket connection;

c. a hollow tube connected to the first end of the flexible wire and connected to one of the first and second catheters; and

d. a metal coating on the inside of each of the first and second catheters.

17. The electrocardiography device of claim 1, wherein at least one of the at least two test leads comprises:

a. a socket connection connected to the ECG monitoring device;

b. a flexible wire having a first end and a second end, the second end connected to the socket connection;

c. a hollow tube connected to the first end of the flexible wire and connected to one of the first and second catheters; and

d. a conductive coating on the outsider surface of each of the first and second catheters with the ground wire connected thereto.

18. The electrocardiography device of claim 1, wherein at least one of the at least two test leads comprises:

a. a socket connection connected to the ECG monitoring device;

b. a flexible wire having a first end and a second end, the second end connected to the socket connection; and

c. a hollow tube connected to the first end of the flexible wire and connected to one of the first and second catheters.

19. A method for obtaining an electrocardiogram from an animal, the method comprising the steps of:

a. providing an ECG monitoring device, a first catheter and a second catheter, a reference lead, and at least two test leads;

b. connecting one of the at least two test leads to the first catheter and the ECG monitoring device;

c. connecting the other of the at least two test leads to the second catheter and the ECG monitoring device, and connecting the reference lead to the animal and the ECG monitoring device;

d. inserting the first catheter into a first vein near the animal's heart, and inserting the second catheter into a second vein near the animal's heart so that the first and second catheters are located on an axis running diagonally across the heart from one of the heart's atriums to a position just below the opposite ventricle of the heart;

e. filling the first catheter and the second catheter with an electrically conductive, physiological solution; and

f. processing a plurality of signals received from the at least two test leads with the ECG monitoring device to produce an electrocardiogram.

20. The method of claim 19, further comprising the step of adding at least one drug to the electrically-conductive, physiological solution as a continuous stream of fluid in order to test the effects of the drug on the animal's heart.

21. The method of claim 19, further comprising the step of adding at least one drug to the

electrically-conductive, physiological solution as a bolus stream of fluid in order to test the effects of the drug on the animal's heart.

22. The method of claim 19, wherein at least one of the at least two test leads comprises:

a. a socket connection connected to the ECG monitoring device;

b. a flexible wire having a first and second end, the second end connected to the socket connection;

c. a hollow tube connected to the first end of the flexible wire and connected to one of the first and second catheters; and

d. an extender wire placed inside one of the first and second catheters and the electrically-conductive, physiological solution, such that the extender wire collects the plurality of signals that the ECG monitoring device uses to produce the electrocardiogram.

23. The method of claim 19, wherein at least one of the at least two test leads comprises:

a. a socket connection connected to the ECG monitoring device;

b. a flexible wire having a first and second end, the second end connected to the socket connection;

c. a hollow tube connected to the first end of the flexible wire and connected to one of the first and second catheters; and

d. a metal coating on the inside of each of the first and second catheters, such that the metal coating collects the plurality of signals that the ECG monitoring device uses to produce the electrocardiogram.

24. The method of claim 19, wherein at least one of the at least two test leads comprises:

a. a socket connection connected to the ECG monitoring device;

b. a flexible wire with a first and second end, the second end connected to the socket connection;

c. a hollow tube connected to the first end of the flexible wire and connected to one of the first and second catheters; and

d. a conductive coating on the outside surface of each of the first and second catheters with the ground wire connected to this outside surface instead of the animal, such that the conductive coating collects the plurality of signals that the ECG monitoring device uses to produce the electrocardiogram.

25. The method of claim 19, wherein at least one of the at least two test leads comprises:

a. a socket connection connected to the ECG monitoring device;

b. a flexible wire with a first and second end, the second end connected to the socket connection; and

c. a hollow tube connected to the first end of the flexible wire and connected to one of the first and second catheters, such that the hollow tube collects the plurality of signals that the ECG monitoring device uses to produce the electrocardiogram.

26. An electrocardiography device for obtaining electrocardiograms from an animal, the device comprising:

a. two intravenous catheters connected to the animal;

b. an electrically conductive, physiological solution contained in each of the two catheters;

c. an ECG monitoring device, and

d. a means for providing an electrical connection between the electrically-conductive, physiological solution and the ECG monitoring device.